United States Department of the Interior
FISH AND WILDLIFE SERVICE

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In Reply refer to:
02EKOK00-2020-F-0467

May 20, 2021

Basharat Siddiqi, Division Administrator
Federal Highway Administration
5801 North Robinson Avenue, Suite 300
Oklahoma City, Oklahoma 73118

Subject: Biological and Conference Opinions for Federal Highway Administration Funding of Oklahoma Department of Transportation's Canadian County JP 26360(04) – Bridge Rehabilitation on U.S. Highway 281 (US-281) over South Canadian River in Caddo County, Oklahoma, 0.86 miles (1.38 kilometers) east of the Canadian County line.

Dear Mr. Siddiqi:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (Opinion) and conference opinion based on our review of the effects of the proposed Oklahoma Department of Transportation's project, Canadian County JP 26360(04) (Project), on the federally-listed threatened Arkansas River shiner (*Notropis girardi*) and its designated critical habitat, pursuant to section 7(a)(2) of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Your request for formal consultation was received on December 15, 2020. We initiated formal consultation on January 19, 2021.

Subsequently, the Service informed the Federal Highway Administration and Oklahoma Department of Transportation regarding location of recently proposed critical habitat for the proposed endangered peppered chub (*Macrhybopsis tetranema*), pursuant to section 7(a)(4) of the Act. We initiated the formal conference on April 21, 2021.

Based on the information submitted to the Service, you have determined that the action may affect, but will not adversely affect the federally-listed whooping crane (*Grus americana*) and piping plover (*Charadrius melodus*). The Service concurs with your effect determination for these species and they will not be addressed further in this consultation.

Although the information submitted included an effect determination for the endangered least tern (*Sterna antillarum*), this species was delisted effective February 12, 2021 (86 FR 2564). You also have determined that this action will not affect the federally-listed threatened red knot (*Calidris canutus rufa*). Consequently, these species will not be addressed further in this

Opinion. The Service expects that all conservation measures proposed and described within the consultation submission as part of the proposed action will be implemented.

These biological and conference opinions are based on information provided in the December 10, 2020, biological assessment (Assessment), telephone and email conversations with Oklahoma Department of Transportation biologists, field investigations, and other sources of information. Literature cited in these biological and conference opinions is not a complete bibliography of all literature available on the species of concern, transportation projects and their effects, or on other subjects considered in these biological and conference opinions. A complete administrative record of this consultation is on file at the Service's Oklahoma Ecological Services Field Office (Field Office) in Tulsa, Oklahoma.

CONSULTATION HISTORY

The Federal Highway Administration requested formal consultation on December 15, 2020.

December 17, 2020	Field Office requested and received additional information from Oklahoma Department of Transportation.
December 21, 2020	Oklahoma Department of Transportation provided corrected dimensions of the existing structure to the Field Office.
January 4, 2021	Field Office requested GIS shapefiles and additional project information.
January 12, 2021	Field Office received shapefiles and new information regarding proposed work road configuration and extent from Oklahoma Department of Transportation.
January 15, 2021	Oklahoma Department of Transportation Natural Resources Program clarified proposed conservation measures.
January 19, 2021	Field Office initiated formal consultation.
April 7, 2021	Field office informed Federal Highway Administration regarding options to address a proposed endangered species and its critical habitat.
April 21, 2021	Federal Highway Administration requested the Service to proceed with a formal conference opinion on the proposed peppered chub critical habitat.
May 20, 2021	Oklahoma Department of Transportation provided new information to the Field Office regarding the proposed action.

BIOLOGICAL AND CONFERENCE OPINIONS

DESCRIPTION OF THE PROPOSED ACTION

Regulations implementing the Act (50 CFR §402.02) define "action" as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies of the United States or upon the high seas." Proposed construction elements of the project (proposed action) consist of site preparation, construction access and staging areas, bridge rehabilitation, in-water work, and post-project site restoration. Detailed descriptions of the proposed action and project elements are presented in the Assessment.

Project Overview

The Oklahoma Department of Transportation, in cooperation with the Federal Highway Administration, is proposing to rehabilitate a structurally-deficient bridge over the South Canadian River (Canadian River) and reconstruct the approach roadways on US-281 (Old 66 Road/Historic Route 66) in Caddo County, Oklahoma. This bridge (National Bridge Inventory number 04085, Bridge "A"; Bridgeport Bridge; William H. Murray Bridge; Pony Bridge) was built in 1933. The bridge was listed as a historic landmark in the National Register of Historic Places on December 4, 2020. The purpose of this rehabilitation project is to correct structural deficiencies and extend the life of the historic structure. The traffic on US-281 is estimated to be 1,100 vehicles per day, projected to increase to 2,400 vehicles per day within forty years (Oklahoma Department of Transportation 2020). The roadway and existing bridge over South Canadian River will be closed to public traffic during rehabilitation of the existing bridge, with all traffic diverted around the project via detours onto existing roads.

The total length of the existing structure is approximately 3,944 ft (1,202 m) with spacing between joints adding nominal length. The two approach spans are steel I-beam spans, each approximately 37.7 feet (ft) (11.5 meters (m)) in length. The main bridge consists of thirty-six steel pony truss spans, each 101.8 feet (31 m) in length, and two steel pony truss spans at either end, each measuring 101.5 ft (30.9 m) in length. All existing truss members will be removed for rehabilitation, along with the existing concrete deck, steel beams, stringers, all bracing members from each span, and the uppermost portions of existing concrete pier columns. The existing pier columns and foundations will remain in place. The existing clear roadway width of the existing bridge is 24 ft (7.3 m).

The existing concrete deck will be removed using mechanical equipment which breaks up the concrete and drops the material to the ground below. Spans over the wetted channel or within the ordinary high water mark will require the use of netting or other approved temporary falsework (framework used to support a building or structure during construction activities) to catch and collect removed concrete. Ordinary high water mark (also known as bankfull channel limit/extent, or OHWM in construction plans) has been defined under Title 33 Navigation and Navigable Waters of the Code of Federal Regulations, as the "line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the

characteristics of the surrounding areas (33 CFR §328.3(e)). Steel stringers, floor beams, braces, and other existing steel elements will be removed and disassembled from exterior truss panels by either cutting through gusset plates or removing rivet connections. Cranes will be used to remove and transfer truss panels to staging areas for rehabilitation work, cleaning via media blasting, and painting as needed. The tops of the existing pier columns will be removed using small equipment to avoid damaging the existing reinforced steel. All elements and concrete will be removed in pieces as large as possible and hauled off the site for disposal. The approach spans will be removed similarly to the main spans, except that the structural elements and abutments will not be rehabilitated or reused. The abutment bridge seats will be completely removed, and the abutment foundation elements will be removed to at least 2 ft (0.6 m) below the proposed ground level.

The length of the rehabilitated structure will be extended to approximately 3,970 ft (1,210 m), with a new clear roadway width of 28 ft (8.5 m). The steel I-beam end spans will be lengthened by removing the existing bridge seat, constructing driven pile foundation supports, and placing precast bridge seats approximately 15 ft (4.6 m) behind the existing abutments. Constructed or precast concrete pier caps will be installed to support the new steel superstructure and concrete deck. Temporary forms may be utilized for the placement and curing of Ultra High Performance Concrete (UHPC) in traverse joints of the deck and along the beams. Once the concrete cures, a diamond grinding process will be used to smooth the driving surface. The proposed improvements will repair or replace existing components, while preserving historic qualities of the structure. For example, the existing, historic pony truss panels will be re-attached to the exterior fascia of the new structure, self-supporting in weight so as to appear functional, without being subjected to actual load-bearing.

The project is anticipated to require removal of vegetation, and controls will be installed around the perimeter to reduce potential for erosion and sedimentation. Slope stabilization measures such as seeding, sodding, sprigging, or mulching may be included to preserve existing vegetation. Following construction, disturbed areas are to be restored to original grades and revegetated with native plantings. The sandy overflow areas of South Canadian River will be restored to naturalistic grade. Areas outside of the critical habitat of Arkansas River shiner will be revegetated with native seed mixes developed for pollinator species where appropriate, as coordinated between the Resident Engineer and the Oklahoma Department of Transportation Natural Resources office. All other areas will be covered with solid slab sod. Construction access and staging areas will make use of rights-of-way, outside of the ordinary high water mark of the South Canadian River. Anticipated activities within the staging areas include storage of equipment and materials, refueling of equipment and vehicles, use of hazardous materials, and construction, use and removal of temporary work roads.

Some construction activities will occur within the ordinary high water mark of the South Canadian River. Temporary work roads will be needed to remove and reinstall the steel trusses of the bridge, and additional pads will be required during project activities to provide stable bases for cranes and other equipment. The project design anticipates that four work roads are needed to rehabilitate the structure, and this may require two work roads in place concurrently on the same side of the river. All work roads and drill pads will be up to 30 ft (9.1 m) in width to allow for the operation and maneuvering of large equipment. The area between the concurrent

work roads is anticipated to be utilized for repair work on the substructure of the bridge, but construction activities will be primarily conducted outside of the ordinary high water mark or confined to the tops of work roads, pads, or platforms. The contractor will submit detailed and explicit descriptions of all proposed work activities within the ordinary high water mark, including placement and timeframes of the temporary work roads and any pads; these plans will be submitted to the Field Office for review, prior to beginning project activities. All temporary work roads and pads within the ordinary high water mark of South Canadian River will be completely removed following construction activities.

The proposed action also includes a vehicle pullout and parking area. This feature is intended to discourage pedestrian activity along the main traffic route by providing the public a safe viewing area of the historic bridge structure. The pullout area also may accommodate a monument and interpretative displays in the future. The precise location has not yet been determined, but the area will be situated outside of the ordinary high water mark of South Canadian River. The pullout is anticipated to cover approximately 17,222 square feet (1,600 m^2) with a driveway accommodating single-vehicle widths and multiple parking spaces. Final design plans will be provided to the Field Office for review prior to implementation.

The estimated duration of the proposed action is expected to be approximately nineteen months (570 days) in total, inclusive of approximately 60 days for activities within the wetted portion and approximately 150 days within the ordinary high water mark of the South Canadian River. The proposed project is expected to let in August, 2021.

Proposed Conservation Measures Provided in the Assessment

The following conservation measures were provided in the Assessment for implementation during the proposed action. All operators, employees, and contractors will be made aware of all environmental commitments, including the following measures to avoid and minimize adverse impacts to the Arkansas River shiner and its critical habitat:

1. Construction activities within the ordinary high water mark of South Canadian River will not occur during the peak spawning and larval/fry development season (May 1 to August 31) of the Arkansas River shiner.

2. Vehicles and other motorized equipment will be confined to areas outside of the ordinary high water mark of South Canadian River at all times, with the exception of activities related to work road (or pad) construction, maintenance and use.

3. Hazardous materials, chemicals, fuels, lubricating oils, and other such substances shall be stored at least 300 ft (91.4 m) from the streambank. Refueling of construction equipment shall also be conducted at least 300 ft (91.4 m) from the streambank.

4. Disturbance to areas within the designated critical habitat and the ordinary high water mark of South Canadian River will be restricted to the minimum required for described work roads and pads.

5. Construction waste materials and debris shall be stockpiled at least 25 ft (7.6 m) from the streambank, and these materials shall be removed and disposed of properly, during and following completion of the project. Sediment and erosion controls shall be installed and maintained around these staging areas to prohibit discharge of materials from these sites.

6. Alteration of natural stream features (such as riffles and pools) within the ordinary high water mark and critical habitat shall be limited to only what is needed for project construction. Disturbance to areas outside of the required construction footprint shall be minimized and the removal of riparian vegetation shall be limited to only what is necessary for project construction. Stream flow (upstream and downstream fish passage) shall be maintained at all times via the use of large pipes or platforms, and no artificially isolated pools will be allowed to develop within the stream channel. The contractor shall submit a detailed and explicit description of all proposed work activities and specify how flow is to be maintained.

7. Work roads and pads within the ordinary high water mark of the South Canadian River will be constructed in such a manner as to avoid and minimize erosion and sedimentation in the river or alteration of the bed and bank substrates, and will be made of crushed, non-erosive rock material that is free of any fines, clays or silts, and of sufficient size to prevent downstream movement (typically rocks with 12 to 24-inch (30.5 to 61 cm) nominal size with smaller rocks no less than 1.5-in (3.8 cm) in diameter). Work roads and pads for this project within the ordinary high water mark will be up to 30 ft (9.1 m) in width to allow for the operation and maneuvering of large equipment. The contractor shall submit a detailed and explicit description of all proposed work activities (including proposed placement for temporary work roads and pads based on actual river conditions at the time of construction) and timeframes to the Oklahoma Department of Transportation biologist, through the Resident Engineer, for review and approval by the Field Office before construction activities begin. The construction and removal of work roads and pads will be monitored by the biologist at every incremental stage. Any alteration to proposed work roads or pads will be submitted to the Field Office for evaluation prior to construction and, if appropriate, consultation re-initiated.

8. Each of the work roads and pads will be constructed only once. Work roads and pads will not impede more than 50 percent of the ordinary high water mark of South Canadian River at any given time.

9. After each work road or pad is no longer needed, fill material will be removed and the natural contours of South Canadian River channel and bank restored to the maximum extent practicable.

10. No water will be pumped from South Canadian River for any reason at any time.

11. Appropriate best management practices to minimize impacts from storm water discharges, as established by the Oklahoma Department of Environmental Quality, will be conscientiously implemented throughout the proposed construction periods. The

effectiveness of erosion controls will be maintained for the duration of construction activities.

12. As soon as possible following construction, in areas where native vegetation could not be preserved, exposed soil will be revegetated with mixtures of plant species native to the ecoregion to restore disturbed areas in Arkansas River shiner critical habitat. Areas outside of designated critical habitat will be evaluated by the Oklahoma Department of Transportation Natural Resources biologist in coordination with the Resident Engineer, and revegetated with the native seed/plant mix developed for pollinator species, where appropriate. All other areas will be covered with solid slab sod. At the completion of construction requirements, the temporary work roads and pads will be removed.

Action Area

An action area is defined at 50 CFR §402.02 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The action area is located in Sections 1, 2, 6, 7, 8, 9, 15,and 16, Township 12 North, Range 10 West, Sections 11 and 12, Township 12 North, Range 11 West, Section 31, Township 13 North, Range 10 West, and Section 36, Township 13 North, Range 11 West (Figure 1). The project was assigned a job piece (JP) identifier of "Canadian County JP 26360(04)", but the bridge structure is wholly within Caddo County, Oklahoma in Section 2, Township 12 North, Range 10 West on U.S. Highway 281 (US-281) approximately 0.86 mi (1.38 km) west of the county line with Canadian County and approximately 0.68 mi (1.1 km) due south of the Blaine County line. The action area, as described in the Assessment, includes an approximately 0.25 mile (mi; 0.4 kilometer (km)) radius around the bridge area, as well as 0.25 mi (0.4 km) upstream and 6.2 river mi (10 river km) downstream from the bridge over the South Canadian River near Bridgeport, Oklahoma.

The action area occurs on the lower South Canadian River, which is located in the Lower Canadian-Walnut watershed (U.S. Geological Survey Hydrologic Unit Code 11090202) in the Arkansas-White-Red River basin flowing into the Mississippi River. The Canadian River originates in the Sangre de Cristo Mountains of southeastern Colorado and northeastern New Mexico, and flows approximately 938 mi (1,510 km) in a southeasterly direction through the Texas panhandle into Oklahoma (Dolliver 1984, Sublette *et al*. 1990). The Upper South, Lower South, and North Canadian River drainage basins total approximately 47,203 square mi (122,255 km^2) in area. Several human-made water impoundments influence the South Canadian River; these include Conchas Lake built in 1938, Ute Reservoir built in 1962, Lake Meredith built in 1965, and Eufaula Reservoir built in 1963 (Bonner and Wilde 2000). The action area is located in the reach between Lake Meredith in Texas and Eufaula Reservoir in Oklahoma. The South Canadian River confluence with the North Canadian River is impounded by Eufaula Reservoir. The Canadian River (South Canadian River) continues eastward as a single stream until the confluence with the Arkansas River at Robert S. Kerr Reservoir in Haskell County, Oklahoma.

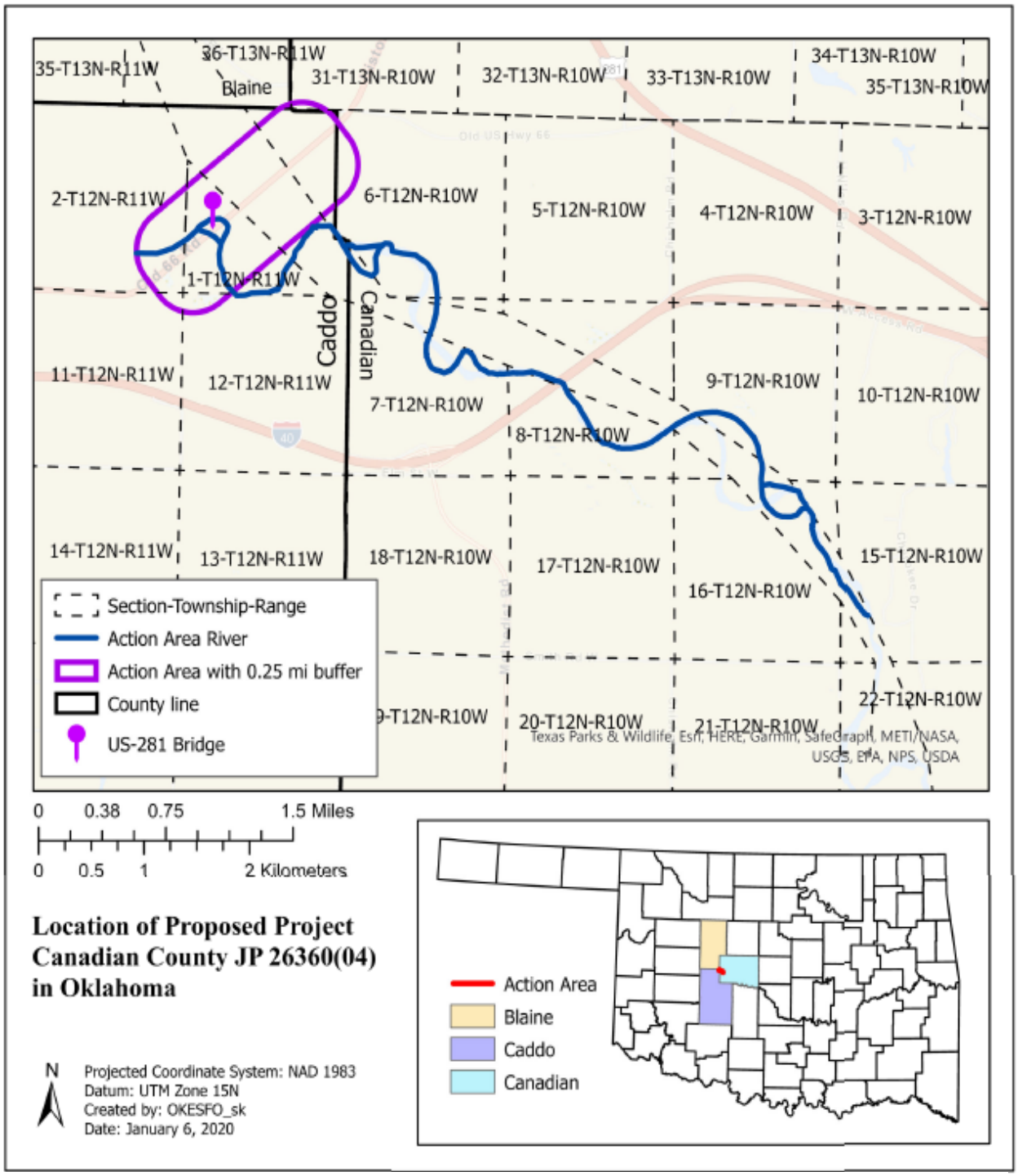

Figure 1. Map depicting location of action area for proposed project JP 26360(04) in Caddo, Canadian, and Blaine Counties in Oklahoma.

The Service's National Wetlands Inventory database classifies the South Canadian River in the action area as R2UBH: riverine, lower perennial (with low gradient) flows with some occurrences of oxygen deficits and drought, and R2USC: riverine, lower perennial (low gradient) flows with unconsolidated substrates, less than 75 percent cover of stones and less than 30

percent vegetative cover of shoreline, seasonally flooded. The sandy shoreline within the ordinary high water mark, downstream of the existing bridge, is classified as palustrine (non-tidal wetland), seasonally flooded and lacking features of bedrock shoreline, with water depths less than 8.2 ft (2.5 m), and hosting some short woody vegetation of broad-leaved, deciduous trees or scrub-shrub.

According to Woods *et al*. (2005), climate of the local area consists of mean annual precipitation of 29 to 38 inches (73.7 to 96.5 cm), with mean daytime temperatures ranging from 82 degrees Fahrenheit (°F; 27.7° Celsius (°C)) in summer, to 35°F (1.7°C) in winter, and an average growing season range of 205 to 225 days. Soils are described as very deep, sandy, loamy, and silty soils on nearly level slopes [Class: Coastal Rolling Red Prairies, Name: Port-Dale-Yahola-Gaddy-Gracemore-McLain-Reniach, Type: Mollisols and Entisols] (Carter and Gregory 2008). The Natural Resource Conservation Service's interactive Web Soil Survey database indicates the riparian areas of South Canadian River at this location to be mostly Gracemont (fine sandy loam) and Ezell (loamy fine sand) with 0 to 1 percent slopes which is frequently flooded. Woods *et al.* (2005) depicts the area as within the Cross Timbers Transition of the Central Great Plains ecoregion, in which there is a mixture of rangeland and cropland with some oil and gas operations. Observed erosion is attributed to river incision due to releases of water from upstream impoundments and cattle grazing (Woods *et al.* 2005).

Natural vegetation in the area includes mixed grass prairie dominated by little bluestem (*Schizachyrium scoparium*), side oats grama (*Bouteloua curtipendula*), blue grama (*B. gracilis*), and Indiangrass (*Sorghastrum nutans*) (Woods *et al.* 2005). Stream banks historically supported hardwood forest prior to the 20th century, and most riparian forests in the area have been degraded or lost due to channelization or land use changes, although cottonwood (*Populus deltoides*), willow (*Salix* spp.), elm (*Ulmus* spp.), ash (*Fraxinus* spp.), walnut (*Juglans* spp.), and pecan (*Carya illinoinensis*) are common (Woods *et al.* 2005). Vegetation types in the action area, as reported in the Assessment, included riparian woodland, tallgrass prairie, maintained grassland, and disturbed prairie. Riparian woodland vegetation adjacent to South Canadian River includes cottonwoods, willows, giant reed (*Arundo donax*), bushy bluestem (*Andropogon glomeratus*), and Johnsongrass (*Sorghum halepense*). Tallgrass prairie vegetation in the action area includes Ashe juniper (*Juniperus ashei*), hackberry (*Celtis occidentalis*), oak (*Quercus* spp.), blackberry (*Rubus* spp.), big bluestem (*Andropogon gerardii*), little bluestem, silver bluestem (*Bothriochloa laguroides*), bushy bluestem, and Western soapberry (*Sapindus saponaria*). Dominant species in the maintained grassland near the roadway include bermudagrass (*Cynodon dactylon*), Johnsongrass, and hackberry. In the disturbed prairie area, the vegetation includes giant ragweed (*Ambrosia trifida*), sunflower (*Helianthos* spp.), dewberry (*Rubus caesius*), and Johnsongrass. According to the Assessment, an unidentified species of minnow was observed swimming within the South Canadian River, and there was evidence of beaver (*Castor canadensis*) activity in the action area.

Land Use and Land Ownership in the Action Area

Land cover in the action area is predominantly agricultural cropland and pasture, residential homesteads, with patchy riparian woodland in the immediate vicinity of the existing bridge (Figure 2). In the early twentieth century, small farms in the action area grew cotton, small

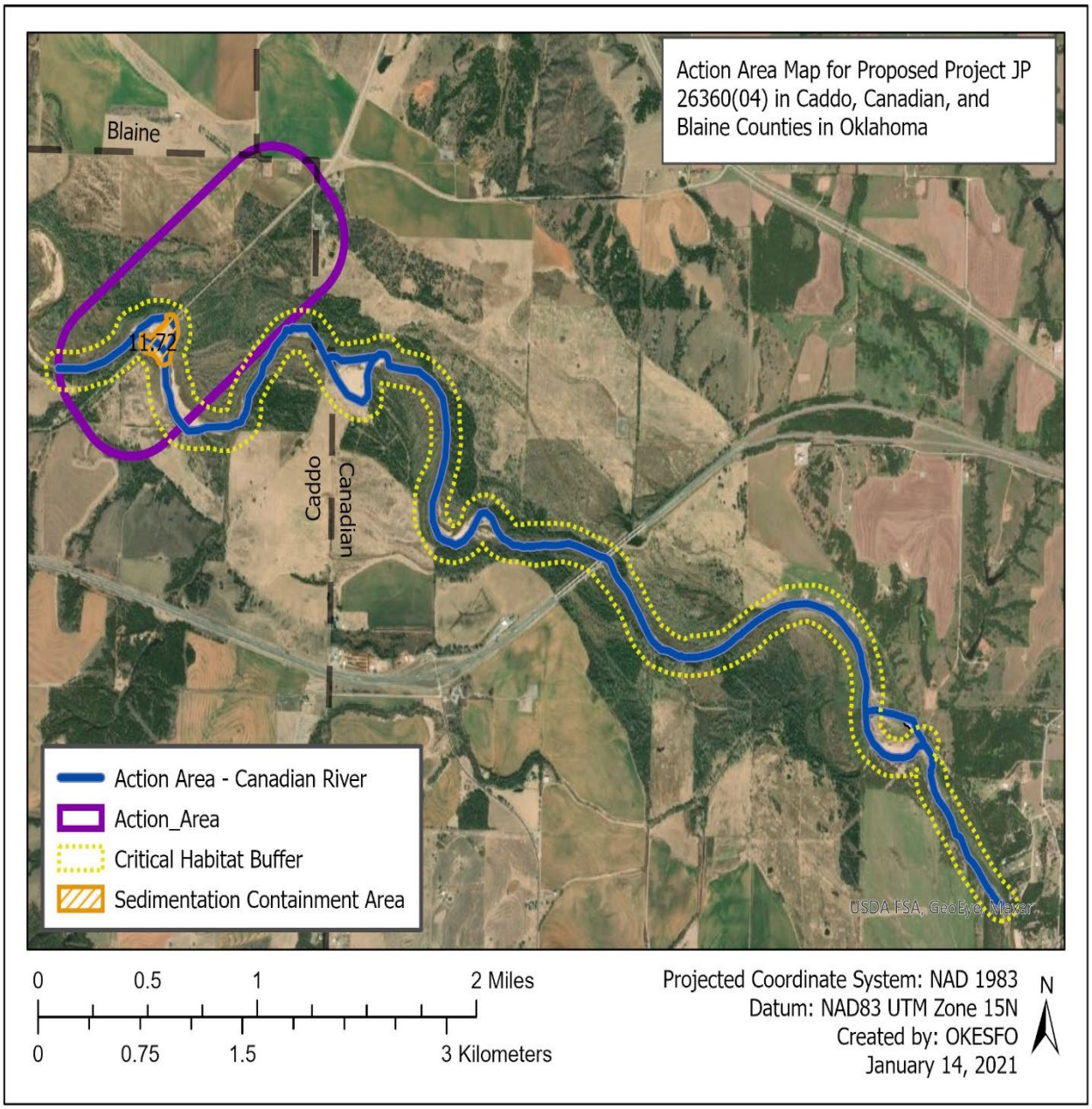

Figure 2. Aerial imagery map of action area and surrounding lands for proposed project JP 26360(04) in Caddo, Canadian, and Blaine Counties, Oklahoma.

grains, and peanuts as principal crops (Duck and Fletcher 1943). Presently, croplands in the area consist mainly of small grains such as sorghum, alfalfa, and soybeans (Woods *et al*. 2005). Field observations reported agricultural lands adjacent to and within the action area, presence of oil wells, and a utility corridor running parallel to the eastern side of the existing bridge. Based on aerial imagery, a two-track dirt road occurs within the utility corridor. This road branches off at multiple points as it reaches the river, and recreational footpaths/trails are visible in aerial imagery.

STATUS OF THE SPECIES AND CRITICAL HABITAT

The sections below summarize the status of the federally-listed threatened Arkansas River shiner and its designated critical habitat as well as information on the proposed peppered chub and its proposed critical habitat. This information is used to help assess whether the proposed action would be likely to jeopardize the continued existence of the species. The "**ENVIRONMENTAL BASELINE**" section that follows summarizes similar information on the species, specifically within the action area, and provides the foundation for the Service's assessment of effects of the proposed action, as presented in the "**EFFECTS OF THE ACTION**" section.

Arkansas River shiner

Description

The Arkansas River shiner is a small cyprinid minnow with a dorsally flattened head, rounded snout and a small subterminal mouth (Miller and Robison 2004, Robison and Buchanan 1998). The dorsal coloration is typically light tan, with silver sides graduating to white on the underbelly. Adults may be up to 2 inches (in; 5.1 centimeters (cm)) in length (Service 2018a). Dorsal, anal, and pelvic fins each have eight rays, with a small black chevron typically present at the base of the caudal fin. Breeding males have two to four rows of tubercles on their pectoral fins, and the sexes are otherwise indistinguishable (Service 2018a).

Status

The Arkansas River Basin population of the Arkansas River shiner was listed as a threatened species under the Act on November 23, 1998 (63 FR 64772). A recovery plan for the Arkansas River shiner has not yet been developed. A species status assessment was completed on October 1, 2018 (Service 2018a).

Critical habitat was originally designated for the Arkansas River shiner on April 4, 2001 (66 FR 18002), and was revised on October 13, 2005 (70 FR 59808), based on legal challenges to the original designation. Four units were proposed as critical habitat, but only two units (Units 1 and 3) were included in the final designation for the Arkansas River shiner (70 FR 59808). Unit 1a included the Canadian River from near Ute Reservoir in New Mexico to the upper reaches of Lake Meredith (Coetas Creek) in Texas but was excluded in the final designation. Unit 1b includes approximately 373 mi (600 km) of the South Canadian River extending from the State Highway 33 bridge near Thomas, Oklahoma, downstream to the Indian Nation Turnpike bridge northwest of McAlester, Oklahoma. Areas within the South Canadian River upstream of the State Highway 33 bridge were excluded from the final designation. Unit 3 includes approximately 286 mi (460 km) of the Cimarron River extending from the United States Highway 54 (US-54) bridge in Seward County, Kansas, to the United States Highway 77 (US-77) bridge in Logan County, Oklahoma. Only the South Canadian River unit is currently considered to be occupied (Service 2018a). The lateral extent of the critical habitat designation includes 300 linear ft (91.4 m) of riparian zone on either side of these rivers at bankfull channel width (measured laterally from the line of bankfull discharge) in Oklahoma and Kansas. The final designation includes the portion of South Canadian River within the proposed action area.

Some developed lands within the 91.4 m (300 ft) lateral extent are not considered critical habitat because they do not contain the primary constituent elements. Primary constituent elements identified in the critical habitat designation for the Arkansas River shiner are:

1. A natural, unregulated hydrologic regime complete with episodes of flood and drought or, if flows are modified or regulated, a hydrologic regime characterized by the duration, magnitude, and frequency of flow events capable of forming and maintaining channel and instream habitat necessary for particular life-stages in appropriate seasons;

2. A complex, braided channel with pool, riffle (shallow area in a streambed causing ripples), run, and backwater components that provide a suitable variety of depths and current velocities in appropriate seasons;

3. A suitable unimpounded stretch of flowing water of sufficient length to allow hatching and development of the larvae;

4. Substrates of predominantly sand, with some patches of silt, gravel, and cobble;

5. Water quality characterized by low concentrations of contaminants and natural, daily and seasonally variable temperature, turbidity, conductivity, dissolved oxygen, and hydrogen ion concentration (pH);

6. Suitable reaches of aquatic habitat, as defined by primary constituent elements 1 through 5 above, and adjacent riparian habitat sufficient to support an abundant terrestrial, semiaquatic, and aquatic invertebrate food base; and

7. Few or no predatory or competitive non-native fish species present.

Distribution

Historically, the Arkansas River shiner was once widespread and common in the western portion of the Arkansas River basin in Arkansas, Kansas, New Mexico, Oklahoma and Texas (Hubbs and Ortenburger 1929, Service 2018a). The species occurs in turbid waters of shallow channels that meander and shift frequently (Gilbert 1980), in pools and backwater habitats (Polivka and Matthews 1997), and in tributaries of large rivers (Bonner 2000). The species was first reported in 1926 from the Cimarron River northwest of Kenton in Cimarron County, Oklahoma (Hubbs and Ortenburger 1929).

This species has subsequently disappeared from over 83 percent of its historical range (Service 2018a), and by the early 1980s, was extremely rare or absent from the Cimarron River (Kansas) and Arkansas River (Pigg 1991). Fish surveys within the Cimarron River (Oklahoma) during 2014 and 2015 found no occurrences of Arkansas River shiner in 580 seining surveys (Mollenhauer *et al.* 2018). As of 2018, the Arkansas River shiner appears to be restricted primarily to contiguous river segments of the South Canadian River basin spanning eastern New Mexico downstream to eastern Oklahoma (Service 2018a). A non-endemic, introduced

population of the Arkansas River shiner occurs in the Pecos River in New Mexico outside of the species' historical range (Bestgen *et al.* 1989, Osborn *et al.* 2013).

Life History

Habitat – Habitat for the Arkansas River shiner consists of the main channels of wide, shallow, sandy bottomed rivers and larger streams of the Arkansas River basin (Gilbert 1980). Adults prefer shallow channels where currents flow over clean fine sand, and generally avoid calm waters and silted or muddy stream bottoms (Cross 1967). However, the species has been observed to occur over silt slightly more than expected based on availability of silty substrate, even where substrates in South Canadian River are predominantly sand (Wilde *et al.* 2000). Microhabitat selection has been observed to be influenced by water depth, current velocity, and water temperature (Wilde *et al*. 2000). Marsh-Matthews and Matthews (2013) suggested that the Arkansas River shiner takes advantage of a much wider variety of available microhabitat types during periods of high flow. Conversely, during periods of low flow, the species has been observed to have a positive association with deeper, shaded habitat near shorelines as refugia (Marsh-Matthews and Matthews 2013).

Cross (1967) considered that adult fish of this species tend to orient into the current on the lee (sheltered) side of transverse sand ridges, feeding upon organisms washed downstream. The species has adapted to tolerate the adverse conditions of the drought-prone prairie streams it inhabits, including a high capacity to endure elevated temperatures and low dissolved oxygen concentrations (Matthews 1987, Service 2018a). During the winter, the species is positively associated with habitats with complex substrates and higher dissolved oxygen concentrations (Marsh-Matthews and Matthews 2013). Juvenile Arkansas River shiners have been most strongly associated with current, conductivity, backwater and island habitat types (Polivka and Matthews 1997). Studies in recent decades indicate the species generally occurs at mean water depths between 6.6 to 8.3 in (17 to 21 cm) and current velocities between 11.7 and 16.4 in (29.7 and 41.6 cm) per second (Polivka and Matthews 1997, Wilde *et al.* 2000).

Reproduction – The Arkansas River shiner is a member of a reproductive guild that broadcast spawns semibuoyant eggs, which are kept suspended until hatching in flowing water (Platania and Altenbach 1998, Johnston 1999, Service 2018a). Examinations of gonadal development in Arkansas River shiners indicated that the species undergoes multiple, asynchronous spawns in a single season (Wilde *et al.* 2000). Successful reproduction by the Arkansas River shiner appears to be strongly correlated with streamflow (Service 2018a). Peak reproductive condition occurs from May to July (Wilde *et al.* 2000, Polivka and Matthews 1997), with spawning occurring as early as April and as late as September (Service 2014). Moore (1944) believed that the trigger for spawning was related to elevated stream flows following heavy rain events, while Bestgen *et al.* (1989) observed spawning in the Pecos River population occurred in conjunction with upstream dam releases.

The fertilized eggs of Arkansas River shiners are non-adhesive and semi-buoyant (Moore 1944). Platania and Altenbach (1998) found that in a controlled environment, spawned eggs settled to the bottom of the aquaria absorbing water and expanding for approximately 10 to 30 minutes before becoming buoyant. Once buoyant, the eggs would then sink when water current was not

maintained, and Platania and Altenbach (1998) concluded that this species likely spawns in the upper to mid-water column during elevated flows to allow time for the eggs to become buoyant and remain suspended. The timing of spawning capitalizes on periodic high flows, a reproductive strategy which may be an adaptation to highly variable and unpredictable environments. In the absence of sufficient stream flows, the eggs would likely settle to the channel bottom, where silt and shifting substrates would smother the eggs, hindering oxygen uptake and causing mortality of the embryos (Service 2014).

Arkansas River shiner eggs typically hatch within 24 to 48 hours, assuming stream flows are adequate to support continued development (Moore 1944, Platania and Altenbach 1998). Upon hatching, larvae remain attached to a yolk sac and begin moving vertically toward the surface of the water (Moore 1944) in an effort to remain suspended in the water column during development. After hatching, adequate lengths of flowing stream are needed to provide the time required by larval Arkansas River shiners to fully develop. Developing larvae require sufficient stream flows to keep them suspended within the water column until they are capable of horizontal movement and are strong enough to leave the main channel (Service 2018a). Larvae typically become capable of horizontal movement within three days of hatching (Moore 1944, Service 2018a). Platania and Altenbach (1998) estimated that the fertilized eggs could be transported between 45 and 89 mi (72 to 143 km) before hatching. Using the same estimates, developing larvae could be transported up to an additional 134 mi (216 km) before becoming capable of horizontal movement. Due to this drift, Bonner and Wilde (2000) speculated that 135 mi (217 km) may be the minimum length of unimpounded river that allows for successful completion of the Arkansas River shiner's life history. However, channel complexity is correlated with stream length. Wider stream segments with more braided channel morphology results in slower transport times which may allow more time for developing eggs and larva to reach their free swimming stage (Service 2018a), as is often typical in meandering prairie rivers such as the South Canadian River.

Age and Growth – Arkansas River shiners live about 3 years (Age-III) (Moore 1944), though the majority of specimens captured during surveys are Age-0 and Age-1 (Bestgen *et al.* 1989). Growth rates are greatest during the first summer of life, while growth of adults Age-1+ is difficult to assess due to high post-spawning morality and limited sample sizes (Moore 1944, Bestgen *et al.* 1989).

Diseases, Parasites, and Predation – No studies have been conducted on the impact of disease or predation upon the Arkansas River shiner; therefore, the significance of these threats upon existing populations is unknown. There is no direct evidence to suggest that disease threatens the continued existence of the species. Disease is not likely to be a significant threat except in isolated instances or under certain habitat conditions, such as crowding during periods of reduced flows, or episodes of poor water quality (*e.g.*, low dissolved oxygen or elevated nutrient levels). During these events, stress reduces resistance to pathogens and disease outbreaks may occur. Parasites and bacterial and viral agents are generally the most common causes of mortality. Lesions caused by injuries, bacterial infections, and parasites often become the sites of secondary fungal infections. The Service's Species Status Assessment (Service 2018a) reported that Arkansas River shiner specimens sampled from South Canadian River in isolated pools during summer drought showed higher levels of stress indicators, such as parasites and poor nutrition,

than those sampled in more favorable habitat conditions (G. Wilde, pers. comm., March 24, 2014). These stranded individuals are more likely to be harmed or killed by other disturbances, such as being injured or displaced from isolated pools by repeated off-road vehicle traffic, and/or by the resulting degradation of habitat quality from increased turbidity, loss of riparian vegetation, and accelerated water loss (Service 2018a).

Some predation of Arkansas River shiner by largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), channel catfish (*lctalurus punctatus*), and other fish species undoubtedly occurs (Howell and Mauk 2011, Service 2018a), but the extent is unknown. Predation by some aquatic birds (*e.g.*, terns, herons, and egrets) and aquatic reptiles (*e.g.*, snakes and turtles) also may occur. Plains fishes have evolved under adverse conditions of widely fluctuating, often intermittent flows, high summer temperatures, high rates of evaporation, and high concentrations of dissolved solids. These conditions are not favored by most large predaceous fish and tend to preclude existence of significant populations of these species. However, alteration of historic flow regimes and construction of reservoirs on the South Canadian River have created favorable conditions for some predatory species such as white bass (*Morone chrysops*) and striped bass (*Morone saxatilis*). State and Federal fish and wildlife management agencies, through cooperative efforts to develop sport fisheries in these reservoirs, have facilitated expansion of the distributions of some predatory species. The impact of predation to Arkansas River shiner is likely to be localized and insignificant, particularly where habitat conditions upstream of reservoirs are not favorable to the long-term establishment of abundant predatory fish populations.

Food habits/feeding behavior – The Arkansas River shiner is a generalized forager and feeds upon both items suspended in the water column and items lying on the substrate (Jimenez 1999, Bonner 2000). Wilde *et al.* (2001) reported that over half of the Arkansas River shiner's diet was comprised of detritus and sand-silt in all months except September through November, with the remainder comprised of aquatic and terrestrial insects. Invertebrates (*e.g.*, insects) were the most important food item, with terrestrial and semiaquatic invertebrates being consumed more frequently than were aquatic invertebrates (Jimenez 1999). Plant material also was common from August through October (Wilde *et al.* 2001). No particular invertebrate taxa dominate the Arkansas River shiner's diet, but Megaloptera, Odonata, Plecoptera, and Trichoptera (aquatic insects) and Coleoptera (terrestrial insect) are common (Wilde *et al.* 2001). In the South Canadian River of Oklahoma, Polivka and Matthews (1997) found that gut contents were dominated by sand/sediment and detritus (decaying organic material). Invertebrate prey, although important, were an incidental component of the diet. In the South Canadian River of New Mexico and Texas, the diet of Arkansas River shiners was dominated by detritus, invertebrates, grass seeds, and sand and silt (Jimenez 1999). In the nonnative population of the Pecos River in New Mexico, fly larvae, copepods, immature mayflies, insect eggs, and seeds were the dominant items observed in the Arkansas River shiner's diet (Service 2018a).

Population Dynamics and Genetics

The Arkansas River shiner was collected in the South Canadian, Arkansas, and Cimarron Rivers, Oklahoma in 1926 by Ortenburger and was first described in 1929 (Hubbs and Ortenburger 1929), although fish collection records from the basin as early as 1884 exist (63 FR 64773).

Hubbs and Ortenburger (1929) speculated that *N. girardi* was closely related to the Red River shiner (*N. bairdi*), finding collected specimens difficult to distinguish. The American Fisheries Society classification for the Arkansas River shiner (Page *et al.* 2013) as Phylum: Chordata, Class: Teleostei, Order: Cypriniformes, Family: Cyprinidae, Genus: Notropis, Species: girardi. The Service recognizes this taxonomic classification (Service 2018a). Osborne *et al.* (2010) examined the genetic status of the Arkansas River shiner as well as potential hybridization of the Arkansas River shiner with other fish species, screening for variation at six microsatellite loci and found moderate to high polymorphism (occurring in several different forms). Based on microsatellite and mitochondrial data analysis of the introduced population in the Pecos River of New Mexico, genetic diversity is high and comparable to that of its putative source population from South Canadian River, and the species has persisted in Pecos River for over 30 years (Osborne *et al.* 2010, Osborne *et al*. 2013).

Reasons for Decline

In the Species Status Assessment (Service 2018a), stressors affecting the viability of the Arkansas River shiner included altered flow regimes, stream fragmentation, modified stream geomorphology, decreased water quality (Mueller *et al.* 2017), and competition and predation from invasive species (Eberle *et al*. 2002). The source of many of these stressors is habitat loss related to the construction of dams and impoundments (a body of water confined within an enclosure) which alter streamflows and fragments streams (Service 2018a). Additional sources of stressors include groundwater withdrawals, development, weather conditions including climate change, invasive vegetation, commercial bait fish harvesting, and off road vehicle use within habitat (Service 2018a).

Impoundments – Impoundments and controlled releases have decreased stream flows throughout the Arkansas River basin, including the South Canadian River, and have contributed to the loss of wide, shallow sand bed river channels characteristic of Arkansas River shiner habitat (Service 2018a). Impoundments often alter the magnitude and frequency of high flows leading to channel stabilization and narrowing downstream, modify streambank plant communities, restrict downstream transport of nutrients that support ecosystem function, and alter river substrate (Poff *et al.* 1997; Mammoliti 2002, Service 2018a). Upstream of dams, impoundments convert shallow lotic (flowing) habitat to deeper lentic habitat, negatively affecting species adapted to flowing riverine systems (Service 2018a). Arkansas River shiners require flowing water in order to successfully reproduce and maintain viable populations (Moore 1944, Platania and Altenbach 1998, Service 2014, 2018a). Low flow events (including isolated pooling) and inundation can impair or eliminate appropriate habitat, and while adults are adapted and can typically survive these events for a short time, populations that experience these events regularly face compromised reproduction and may not persist (Service 2018a). Arkansas River shiners, like other fish poorly adapted to lentic conditions, also would likely experience increased mortality from large piscivorous (fish-eating predators) fish in impoundments (Winston *et al.* 1991).

In the Texas panhandle, particularly downstream from Sanford Dam at Lake Meredith, the South Canadian River has undergone dramatic changes that have affected the fish assemblage (Friedman *et al.* 1998, Bonner and Wilde 2000). Upstream of Lake Meredith in New Mexico, inflows to Lake Meredith are reduced due to Ute Reservoir, and Lake Meredith has never

discharged (Cepeda 2016). Consequently, the South Canadian River downstream of Lake Meredith is small (10 ft; 3 m wide) and fed by seepage from the dam (Bonner and Wilde 2000). West of the Oklahoma-Texas border, the South Canadian River contains only 24 percent of its historic volume (Bonner and Wilde 2000). This altered hydrology has, in turn, affected channel morphology. Historically, the river had a wide, braided-channel but now has a narrower channel with sections that lack braids (Friedman *et al.* 1998).

Climate change – Ongoing climate change is another factor potentially affecting aquatic organisms, including fishes. Based on a national climate assessment, Kloesel *et al*. (2018) asserted that, in the Great Plains, both aquatic and terrestrial ecosystems are being affected directly and indirectly by climate change. The broad effects of climate change have been well-documented, and such effects are expected to occur across the entire United States (Portmann *et al.* 2009).

The 98th meridian (referring to the degrees longitude west of the Prime Meridian in Greenwich, England) passes through the central United States, including central Oklahoma and the action area for this project. This meridian has historically been recognized as a climatic "dry line" dividing the arid west from the more humid east (Powell 1879, Webb 1931). This aridity gradient occurs due to atmospheric circulation of moisture (precipitation) and wind (Seager *et al*. 2018, Kukal and Irmak 2016) and exerts a significant influence over soil moisture, precipitation patterns, and vegetation types (Seager *et al.* 2018). Trends indicate this climatic "dry line" is gradually moving eastward with climate models generally predicting increased precipitation east of the dry line, and increasing temperatures (with reduced precipitation) in the west (Portmann *et al*. 2009). If these trends continue, the changing climatic conditions are expected to directly or indirectly have an adverse impact on both terrestrial and aquatic ecosystems (Kaushal *et al*. 2010), including fish populations in Oklahoma. Altered precipitation patterns may occur with heavy rainfall increasing in duration and intensity (Solomon *et al*. 2007, U.S. Global Change Research Program 2017). In some instances, increased precipitation may exacerbate high flows or typical stochastic flood events. Assuming the timing of these flows is not greatly modified, spawning by some fishes may be enhanced (Tonn 1990), with the ranges of some fish species expanding in streams with extensive free-flowing reaches (Holdgate 1986). However, existing impoundments on the South Canadian River truncate and limit natural dispersal of the Arkansas River shiner, and the extent to which increased precipitation or altered flood events may influence the species is not precisely known.

Heat waves and chronic, long-duration hydrological drought are increasing in frequency and duration (U.S. Global Change Research Program 2017). Annual average temperatures and drought have been increasing since the early 20th century and these trends are expected to continue throughout the 21st century (Kloesel *et al*. 2018). Most likely to be critical for fish in the Great Plains are declining stream flows and drought. Cook *et al*. (2015) projected a substantial increase in the risk of drought in the southwest and central plains under both moderate and high future emissions scenarios used for current climate change modeling, exceeding droughts observed during the last millennium. Seager *et al*. (2007) suggested that extreme drought conditions similar to the 'dust bowl' of the 1930s could become the new climate of the southwestern United States. Groundwater extraction, surface water withdrawals, and associated appropriations may exceed availability, particularly as human populations expand,

increasing demands beyond available stored reserves. Water availability and use is confounded by extended drought, which may result in a decrease in base flow in streams and protracted low flow conditions (Mashburn *et al.* 2019). As flows decline, aquatic habitats used by fish are altered and reduced. Warmer air temperatures typically observed during extended summer droughts may lead to increased evapotranspiration and drier soils (Dong *et al.* 2011, Flanagan *et al*. 2017, Herceg *et al.* 2019). Solar radiation during the growing season, combined with the higher aridity associated with decreased precipitation may contribute to further soil dessication (Dong *et al*. 2011, Flanagan *et al.* 2017). Reduced soil moisture may be particularly problematic in riparian zones where elevated soil moisture exerts a substantial influence over the composition, structure and health of vegetative communities. Planting or restoring riparian vegetation displaced by the project may help to minimize the effects of increasing air temperatures on water temperature (Wondzell *et al.* 2019).

Freshwater ecosystems which are already stressed by a variety of anthropogenic factors may be particularly sensitive to the effects of climate change (Burton and Likens 1973, Wright *et al.* 1999, Kaushal *et al.* 2008). Small populations occurring in already-fragmented habitat may be more vulnerable to effects of climate change and other stressors, particularly for species with limited dispersal abilities (McLaughlin *et al*. 2002). Certain species may be able to adapt to extreme droughts, floods of unprecedented magnitude or frequency, and severe temperatures brought about by climate change, while other species cannot, resulting in impacts to ecosystems (Kloesel *et al*. 2018, Falk *et al.* 2019). More mobile species will likely shift to suitable habitats in response to deteriorated conditions (Urban 2015) and warming of the climate (McLaughlin *et al.* 2002, Thomas *et al.* 2004). Impoundments on the South Canadian River currently truncate and limit the Arkansas River shiner's ability to shift its range in response to stressors.

The response of both terrestrial and aquatic species to climate change is complex and variable and is often difficult to predict with certainty. However, several responses, many of them negative, are likely. These components negatively affect the Arkansas River shiner due to their small population size (and likely compromised genetic diversity), relatively limited dispersal ability, and probable difficulty in responding to behavioral changes because of their specialized life cycles (Service 2018a). Despite medium to high confidence in such predictions, it is difficult to determine with any precision as to whether the proposed project would significantly contribute to an increase in factors which exacerbate climate change and its implications for the Arkansas River shiner.

Invasive vegetation – Encroachment of non-native riparian and aquatic vegetation, such as salt cedar (*Tamarix* spp.) and phragmites (*Phragmites australis*), may also affect fish habitat conditions in the Great Plains (Service 2018a) by altering the stream-riparian carbon-exchange, macroinvertebrate community, and other ecosystem components (East *et al*. 2017). Riparian areas contribute to bank stability and help to reduce erosion and sedimentation in streams (Oklahoma Cooperative Extension Service 1998). Shade provided by overhanging vegetation helps moderate stream temperatures and reduces algal production (Oklahoma Cooperative Extension Service 1998). Riparian areas also function to provide dissolved carbon compounds and particulate organic matter to streams (Welsch 1991). When droughts alter soil moisture and contribute to reduced stream flows, degradation of the riparian zone may occur. Degradation will ultimately impact the ability of riparian zones to maintain current stream conditions over time

and in some instances, altered conditions may even favor establishment of non-native vegetation (Garssen *et al*. 2014). As water temperatures rise in response to affected vegetation in riparian zones, water quality will be directly affected.

Water quality – Adequate water quality is necessary to maintain suitable conditions for Arkansas River shiners, and existing water quality may be impaired through contamination or alteration of water chemistry (Service 2018a). Dissolved oxygen levels may be reduced from increased nutrients in the water column due to runoff or wastewater effluent (Service 2018a). Water temperature is a significant factor influencing community structure and temporal succession in most aquatic organisms (Burton and Likens 1973). The Service's Species Status Assessment (Service 2018a) states that "increased water temperature from climate change and from low flows during drought can exacerbate low dissolved oxygen levels, especially when reduced flows strand fish in isolated pools. Similarly, fish stranded in isolated pools can be subjected to increased salinity. Land use activities that may result in poor water quality include irrigated cropland, concentrated animal feeding operations, municipal solid waste sites, and stormwater runoff from urban areas."

Recovery and Management

A recovery plan for the Arkansas River shiner has not yet been developed, but in the Final Rule for the designation of critical habitat for Arkansas River shiner, transplantation of individuals from the Pecos River population is raised as a possible management action (70 FR 59808). In its current Species Status Assessment, the Service analyzed the present condition of the Arkansas River shiner, which determined that the species persists in the Upper and Lower South Canadian River (Service 2018a). Three other resiliency units were identified for the Arkansas River shiner, in which the species no longer occurs but where multiple habitat factors are met which have potential for future recovery efforts. These are: Arkansas River mainstem and the Salt Fork River, Cimarron River from the Oklahoma/Kansas border downstream to Keystone Reservoir, and the North Canadian River from Oklahoma City downstream to Eufaula Reservoir (Service 2018a).

Previous Formal Consultations

- In 2010, the Service issued a non-jeopardy/no adverse modification biological opinion regarding the effects to the Arkansas River shiner and its critical habitat from the Federal Highway Administration's and Oklahoma Department of Transportation's replacement of a bridge on Interstate 35 (I-35) over the South Canadian River near Norman in Cleveland County, Oklahoma (Service 2010a). The total maximum area of incidental take for the Arkansas River shiner, using impacts to occupied habitat as a surrogate measure, was 1.71 acres (0.69 hectares (ha)) within the ordinary high water mark. Of the total area impacted, the Service estimated that about 0.81 acres (0.33 ha) of critical habitat would be temporarily impacted by proposed construction activities.

- In 2010, the Service issued a non-jeopardy/no adverse modification biological opinion regarding the effects to the Arkansas River shiner and its critical habitat from the Federal Highway Administration's and Oklahoma Department of Transportation's replacement of

a bridge on State Highway 3W (SH-3W) over the South Canadian River near Asher in Pottawatomie County, Oklahoma (Service 2010b). The total maximum amount of incidental take for the Arkansas River shiner, using impacts to occupied habitat as a surrogate measure, was 1.13 acres (0.46 ha) of stream habitat within the ordinary high water mark. Of the total area impacted, the Service estimated that about 0.27 acres (0.11 ha) of critical habitat would be permanently lost due to proposed construction activities.

- In 2011, the Service issued a non-jeopardy/no adverse modification biological opinion regarding the effects to the Arkansas River shiner and its critical habitat from the Federal Highway Administration's and Oklahoma Department of Transportation's replacement of the eastbound and westbound bridges on Interstate 40 (I-40) over the South Canadian River in Canadian County, Oklahoma (Service 2011). The total maximum amount of incidental take for the Arkansas River shiner, using impacts to occupied habitat and adjacent riparian zone as a surrogate measure, was 1.45 acres (0.59 ha) of stream habitat within the ordinary high water mark and 2.94 acres (1.19 ha) of adjacent riparian habitat, totaling 4.39 acres (1.78 ha). This project was completed in September, 2016. The action area for this completed project is within the action area of the current, proposed project.

- In 2014, the Service issued a non-jeopardy biological opinion regaring the effects to the Arkansas River shiner from National Park Service's implementation of the Lake Meredith National Recreation Area Off-Road Vehicle Management Plan (Service 2014). The opinion stated that take of the species would be expected to result from the effects of recreational activities and off-road vehicle crossings of the (South) Canadian River, including erosion, sedimentation, and introduction of contaminants. Off-road vehicle crossings of the (South) Canadian River would be limited to certain designated, marked access points within 5 river miles (8.9 km) of the Rosita Flats unit to the (South) Canadian River's confluence with Chicken Creek, the only zone and area covered by the incidental take statement.

- In 2016, the Service issued a non-jeopardy/no adverse modification biological opinion regarding the effects to the Arkansas River shiner and its critical habitat from the Federal Highway Administration's and Oklahoma Department of Transportation's replacement of a bridge on United States Highway 77 (US-77) over the South Canadian River near Lexington and Purcell in McClain County, Oklahoma (Service 2016a). The total maximum amount of incidental take for the Arkansas River shiner, using impacts to occupied habitat as a surrogate measure, was 0.54 acres (0.22 ha) of stream habitat within the ordinary high water mark. The Service anticipated that about 3.16 acres (1.28 ha) of critical habitat would be temporarily impacted by the proposed project. Another 0.54 acres (0.22 ha) of critical habitat would be permanently lost due to construction activities. Project activities were completed in May, 2020.

- In 2016, the Service issued a non-jeopardy/no adverse modification biological opinion regarding the effects to the Arkansas River shiner and its critical habitat from Federal Highway Administration's and Oklahoma Department of Transportation's replacement of a bridge on United States Highway 183 (US-183) over South Canadian River near Taloga in Dewey County, Oklahoma (Service 2016b). The total maximum area of incidental take

for Arkansas River shiner was 0.931 acres (0.377 ha) within the ordinary high water mark. Project activities were completed in March, 2020.

- In 2018, the Service issued a non-jeopardy biological opinion regarding the Army Corps of Engineers' issuance of a Section 404 Clean Water Act permit for Energy Transfer Partner's proposed removal of a natural gas pipeline in Hemphill County, Texas (Service 2018b). The opinion stated that take of the species would be expected to result from the removal of 20 ft (6 m) of exposed pipeline from the South Canadian River channel and changes in river direction, velocity, sedimentation and turbidity. The duration of the in-water work would be five days. Based on use of habitat as proxy, the total maximum area of incidental take for Arkansas River shiner was 1,000 ft^2 (92.9 m^2 ; 0.009 ha) within the South Canadian River channel approximately 1 mile (1.6 km) south of the Highway 60 bridge over (South) Canadian River near Canadian, Texas.

Peppered Chub/Proposed Critical Habitat

The peppered chub was proposed for listing as endangered under the Act on December 1, 2020 (85 FR 77108). Critical habitat for the peppered chub also was proposed and included about 1,068 river miles (1,719 river kilometers) within four units in Kansas, New Mexico, Oklahoma and Texas. A complete description of the species, its status and factors affecting its status is provided in the December 1, 2020, proposed rule.

The proposed rule also describes the four units of the proposed critical habitat designation. Unit 1, the area between Ute Reservoir and Lake Meredith in New Mexico and Texas, is currently occupied. The other three units are currently unoccupied. Critical habitat, as proposed, includes the area within the stream bed/channel up to the extent of the bankfull width. The action area of the proposed bridge project is located within Unit 2. Unit 2 encompasses about 400 river miles (644 river kilometers) in the lower South Canadian River. The upstream limit of Unit 2 begins at the U.S. Highway 83 bridge north of Canadian, Texas and extends downstream to the U.S. Highway 75 bridge northwest of Calvin, Oklahoma. Although this critical habitat unit was not considered to be occupied at the time of the proposed rule, it contains at least one of the five identified physical or biological features (PBF) essential to the conservation of the species. This unit provides an unobstructed river segment of greater than 127 river miles (205 river kilometers) in length and is characterized by a complex braided channel with substrates of predominantly sand but with patches of silt, gravel, and cobble (PBF 1).

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency

activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

Status of the Species and Critical Habitat within the Action Area

The action area includes a segment of the South Canadian River where the Arkansas River shiner is known to persist (Service 2018a), and lies within Unit 1b of the final designation of critical habitat for the species. Unit 1b of the critical habitat designation for Arkansas River shiner includes 246 river mi (396 river km) of the South Canadian River and a lateral extent of 300 linear ft (91.4 m) of riparian zone on either side of the river at bankfull channel width. This unit extends from near Thomas, Oklahoma downstream to near McAlester, Oklahoma.

Although the action area is not currently known to be occupied by the peppered chub, the action area lies within Unit 2 of the proposed critical habitat designation for the peppered chub. Unit 2 begins near Canadian, Texas and extends downstream to the U.S. Highway 75 bridge northwest of Calvin, Oklahoma. This unit, as previously discussed, contains at least one of the five identified physical or biological features essential to the conservation of the species.

Factors Affecting the Species' Environment within the Action Area

As previously discussed in more detail, habitat fragmentation, impoundments, altered flow regimes, modified stream geomorphology, water quality degradation, weather conditions including climate change, alterations to riparian habitat, groundwater withdrawals, invasive vegetation, commercial bait fish harvesting, off road vehicle use within habitat, and other factors have affected the Arkansas River shiner throughout its range and within the action area; such factors occur at various intensities and duration within the action area and are expected to continue to influence the quality and availability of its suitable habitat within the action area.

EFFECTS OF THE ACTION

Listed species/critical habitat (Arkansas River shiner)

In accordance with 50 CFR §402.02, effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of all other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see §402.17). While analyzing effects of the proposed action, the Service considered proximity of the action to known species locations in relation to the action area, distribution and location of likely effects from the proposed action, timing in relation to sensitive periods of the species' life cycle, nature of the effects through deconstruction of each stage of the proposed action, duration of the proposed action, disturbance frequency, disturbance intensity, disturbance severity, and whether the effects would be short-term, long-term, or permanent,.

The Service anticipates that the local population of Arkansas River shiners occupying the South Canadian River and any connected streams within the action area would be adversely affected by the proposed project. In-water activities are anticipated to directly and indirectly impact the Arkansas River shiner and its critical habitat within the action area. Direct and indirect effects of the proposed action on the Arkansas River shiner include habitat alteration and potential mortality. The proposed action involves work within the ordinary high water mark and wetted stream channel of the South Canadian River at US-281 (Old 66 Road/Historic Route 66) east of Bridgeport, Oklahoma. The proposed in-water work (including construction of work roads, pads, platforms, and work space) is estimated to take approximately 60 days for activities within the wetted portion and approximately 150 days within the ordinary high water mark of the South Canadian River.

Areas within the ordinary high water mark are considered to be part of Arkansas River shiner habitat because the stream bed provides shade, undercuts, and other habitat characteristics used by fish, particularly during flood events. Project activities occurring outside of the ordinary high water mark are not anticipated to directly impact the fish, but direct and indirect impacts to designated critical habitat through activities in the riparian zone of the South Canadian River are reasonably certain to occur. The temporary work roads necessary for this project are expected to result in increased sedimentation and turbidity. As such, the Oklahoma Department of Transportation will put conservation measures in place to minimize impacts to streambanks and water quality as a part of the proposed action. Implementation of these conservation measures as a part of the proposed action will help to minimize the anticipated direct and indirect impacts to the Arkansas River shiner and its critical habitat.

The placement of materials for temporary work roads across wetted channels have the potential to cause direct mortality to Arkansas River shiner which may be occupying the area. Placement of these materials within the ordinary high water mark of South Canadian River also are anticipated to have indirect effects to Arkansas River shiner in the form of changes to the riparian area, sandbars and islands which may affect geomorphology, stream flow, temperature, transport of sediment, disturbance of substrate, or impacts to fish behavior or movement. Indirect effects would be expected to occur from implementation of the proposed project, including some level of increased sedimentation. The sediment will be deposited downstream and have the potential to temporarily alter stream substrates and decrease the abundance of aquatic insects which serve as the forage base for Arkansas River shiner. As part of the proposed action, efforts will be employed to decrease sedimentation to the extent feasible and practical. Additionally, post-construction restoration of riparian vegetation and streambank stabilization is included in the proposed action to help minimize risk of further sedimentation, maintain stream bank integrity, maintain water quality, and return the area to a representative and functional ecological condition.

Proposed species/critical habitat (Peppered chub)

The reach within the action area is not currently occupied by the peppered chub and no impacts to the species are expected. Service anticipates that the proposed critical habitat for the peppered chub within the action area would be adversely affected by the proposed project. Direct and indirect effects from the in-water activities of the proposed action on the proposed critical habitat

for peppered chub include substrate disturbance, alteration and sedimentation. The proposed in-water work (including construction of work roads, pads, platforms, and work space) is estimated to take approximately 60 days for activities within the wetted portion of the South Canadian River at US-281 (Old 66 Road/Historic Route 66) east of Bridgeport, Oklahoma.

Placement of foreign materials across the wetted channels within the ordinary high water mark of the South Canadian River to support planned temporary work roads are anticipated to alter proposed critical habitat for peppered chub by causing changes to the native riparian vegetation, sandbars and islands which in turn, may result in modification of stream geomorphology, stream flows, temperature, sediment transport and composition, or impact fish behavior and movement. Some level of increased sedimentation is to be expected. The sediment will be deposited downstream and have the potential to temporarily alter stream substrates and decrease the abundance of aquatic insects within the proposed critical habitat area. As part of the proposed action, efforts will be employed to decrease sedimentation to the extent feasible and practical. The conservation measures implemented by Oklahoma Department of Transportation for the Arkansas River shiner and its critical habitat would similarly minimize direct and indirect impacts to the proposed critical habitat for peppered chub. Restoration of native riparian vegetation and streambank stabilization is included in the proposed action to minimize risk of further sedimentation, maintain stream bank integrity, maintain water quality, and return the area to a representative and functional ecological condition. Such management actions also may serve to ameliorate known threats to the species (85 FR 77122).

CUMULATIVE EFFECTS

Cumulative effects are those "effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area" considered in this Opinion (50 CFR §402.02). Non-federal actions that could negatively impact the Arkansas River shiner and/or its critical habitat are reasonably certain to occur within the action area. Such actions will typically include vehicular traffic, recreational use of the river and riparian areas, use of off-road vehicles within the ordinary high water mark, commercial and residential use of roadside zones, agricultural activities, livestock grazing, utilities' maintenance, and rights-of-way maintenance. Most of these actions do not have a federal nexus. Consequently, the Service currently lacks planning information that would identify their likely scope and location, such that we could accurately predict the magnitude of their impacts on species and habitats. We do not anticipate that overall land use in the area will be altered by the proposed action, or will change dramatically from recent trends. Therefore, additional non-federal actions will continue to occur in the action area and may have additional, cumulative effects on these species and their habitats. However, we currently are unable to estimate those effects.

CONCLUSION

Listed species/critical habitat (Arkansas River shiner)

After reviewing the current status of the Arkansas River shiner and its critical habitat, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the

continued existence of the Arkansas River shiner or result in destruction or adverse modification of its critical habitat. Because sedimentation and direct impacts to the substrates used by federally-listed fishes would occur, as described in this Opinion, we anticipate that the proposed action may result in alteration of suitable habitat and possibly mortality of the Arkansas River shiner.

We base the above conclusions on the following:

1. The project could alter approximately 2.74 acres (1.1 ha) of habitat within the ordinary high water mark which is only a small fraction of available Arkansas River shiner habitat in South Canadian River.

2. The area of occupied range encompassed by the action area is small proportionately compared to the current occupied range of the Arkansas River shiner.

3. The areas within the ordinary high water mark of the South Canadian River are considered habitat due to potential use by fish at certain times during the year, and due to the unpredictable nature of flows and flood events affecting the position of the wetted portions of the channel in relation to the project activities.

4. Impacts due to placement, use, and removal of work roads will be temporary in nature and primarily related to fish passage restrictions and substrate disturbance.

5. Designated critical habitat will be impacted, however, due to the isolated nature and limited scope of the proposed action, impacts will be short term and localized.

6. No recovery actions will be affected by implementation of the proposed project.

7. The conservation measures proposed by the Federal Highway Administration and Oklahoma Department of Transportation, as described in the Assessment, will be implemented. These measures will help minimize the severity, extent and duration of project effects.

Proposed species/critical habitat (Peppered chub)

After reviewing the current status of the peppered chub, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's conference opinion that the described action, as proposed, is not likely to jeopardize the continued existence of the proposed peppered chub, and is not likely to destroy or adversely modify proposed critical habitat. Because sedimentation and direct impacts to the stream substrates are expected, we anticipate that the proposed action may result in alteration of suitable proposed critical habitat of the peppered chub.

We base the above conclusions on the following:

1. The action area is outside of the current occupied range of the peppered chub.

2. The project could alter approximately 2.74 acres (1.1 ha) of habitat within the ordinary high water mark which is only a small fraction of proposed critical habitat for peppered chub in South Canadian River.

3. The areas within the ordinary high water mark of the South Canadian River are considered habitat due to potential use by fish at certain times during the year, and due to the unpredictable nature of flows and flood events affecting the position of the wetted portions of the channel in relation to the project activities.

4. Substrate disturbance due to placement, use, and removal of work roads will be temporary in nature.

5. Proposed critical habitat will be impacted, however, due to the isolated nature and limited scope of the proposed action, impacts will be short term and localized.

6. No recovery actions will be affected by implementation of the proposed project.

7. The conservation measures as described in the Assessment pertaining to critical habitat of Arkansas River shiner will be implemented and similarly help to minimize the severity, extent and duration of project effects to the proposed critical habitat of peppered chub.

The conclusions of this biological and conference opinion are based on full implementation of the project as described in the **DESCRIPTION OF THE PROPOSED ACTION** section of this document, including any conservation measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR §17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR §17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by the Federal Highway Administration and/or its designated representative (Oklahoma Department of Transportation) as appropriate, for the exemption in section 7(o)(2) to apply. The Federal

Highway Administration has a continuing duty to regulate the activity covered by this incidental take statement. If the Federal Highway Administration (1) fails to assume and implement the terms and conditions or (2) fails to require the Oklahoma Department of Transportation to adhere to the terms of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Federal Highway Administration and/or the Oklahoma Department of Transportation must report the progress of the action and its impact on the species as specified in the incidental take statement [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Arkansas River shiner

The following levels of take for Arkansas River shiner may be anticipated by disruption of normal behavioral activities and the loss of essential habitat elements due to water quality degradation, placement of foreign material into the stream and sedimentation resulting from the installation, use and removal of work roads/pads and rehabilitation of the old bridge. The Service concludes that the conservation measures being implemented as a part of this action, inclusive of avoiding in-water activities during the peak reproductive and growth period for this species, will help to minimize the anticipated take of the Arkansas River shiner and impacts to its critical habitat.

The Service anticipates that any Arkansas River shiner individuals residing within the action area could be taken as a result of the proposed action. We anticipate that some Arkansas River shiner inhabiting the area would be killed or harmed during or subsequent to construction by local flow displacements and/or by increased inputs of fine sediments. Areas covered by work roads, pads, and/or platforms and any areas heavily impacted by sedimentation could be made unproductive as spawning and feeding habitats, and this will constitute a permanent or protracted loss. The majority of the take would be in the form of harm, harassment, and injury, such as wounding or killing, of individual Arkansas River shiners at various stages of life.

The Service expects incidental take of individual Arkansas River shiner will be difficult to detect for the following reasons: presence/absence surveys of this species are not typically exhaustive and completely effective as live capture rates are low due to its small body size and low abundance (Service 2018a). Finding a dead or impaired specimen is unlikely because the species has a small body size and is difficult to detect under most conditions (Mollenhauer *et al.* 2018). Additionally, sublethal physiological effects may be delayed or not readily apparent in observed individuals. Therefore, we lack information necessary to quantify the number of individuals that would be taken. Take will be determined based on the description of activities expected to affect the species and using habitat area as a surrogate for the species. Despite these constraints, the Service is obligated to describe the amount or extent or such anticipated incidental take based on the amount of occupied habitat that may be disturbed. The amount of take will be quantified using a total area of impacted habitat within the ordinary high water mark of the South Canadian River, including each work road/pad and the adjacent area into which flow will be displaced laterally.

The area of temporary change, compaction, and displacement of substrate resulting from the construction, use and demolition of work road sections, waste material stockpile, and use of the space between parallel work roads to be located within the ordinary high water mark of the South Canadian River, is anticipated to be 2.74 acres (1.1 ha). Correspondingly, the area of temporary change, compaction, and displacement of substrate resulting from the construction, use and demolition of work road sections, waste material stockpile, and use of the space between parallel work roads located within the critical habitat riparian area is anticipated to be 2.38 acres (0.96 ha) (Table 1). The maximum area of anticipated incidental take for the Arkansas River shiner is 2.74 acres (1.1 ha) for the duration of project activities within the ordinary high water mark of South Canadian River, which is estimated to require 60 days.

Table 1. Measurements used to estimate areas of potential impact to Arkansas River shiner and its critical habitat from JP 26360 (04) on U.S. Highway 281 over South Canadian River in Caddo County, Oklahoma.

Type	Description	Area (acres)	Area (hectares)
Work Roads	within OHWM	1.32	0.53
Work Area		1.42	0.57
		Subtotal: 2.74	*1.10*
Work Roads	within Critical	1.39	0.56
Work Area	Habitat riparian area	0.99	0.40
		Subtotal: 2.38	*0.96*

Additionally, an area of potential erosion and movement of sediments resulting from project activities encompasses an area of approximately 11.72 acres (4.74 ha) (Figure 3). This area includes an upstream backwash zone, an area of potential scour in the riparian zone, and a downstream area likely to experience significant, elevated concentrations of fine sediments unless robust sedimentation and erosion controls are implemented and maintained during the project. This identified area will be of primary focus for enhanced sediment containment and controls, but only the work road and adjacent space within the ordinary high water mark are included in the maximum area of incidental take of the Arkansas River shiner. For purposes of this Opinion, the Service is defining incidental take in terms of the amount of suitable habitat acres impacted within the ordinary high water mark, because habitat loss and disturbance is the primary cause of the take of the species anticipated to result from this project.

Peppered chub

The Service does not anticipate the proposed action will incidentally take any peppered chubs. Therefore, there are no reasonable and prudent measures or terms and conditions for the peppered chub.

Use of Impacts to Habitat as a Surrogate for Take

The use of habitat as a surrogate in expressing the amount or extent of anticipated incidental take is consistent with existing Service policy. As explained in the Service's May 2015 Final Rule (80 FR 26832), surrogates may be used to express the amount or extent of anticipated take,

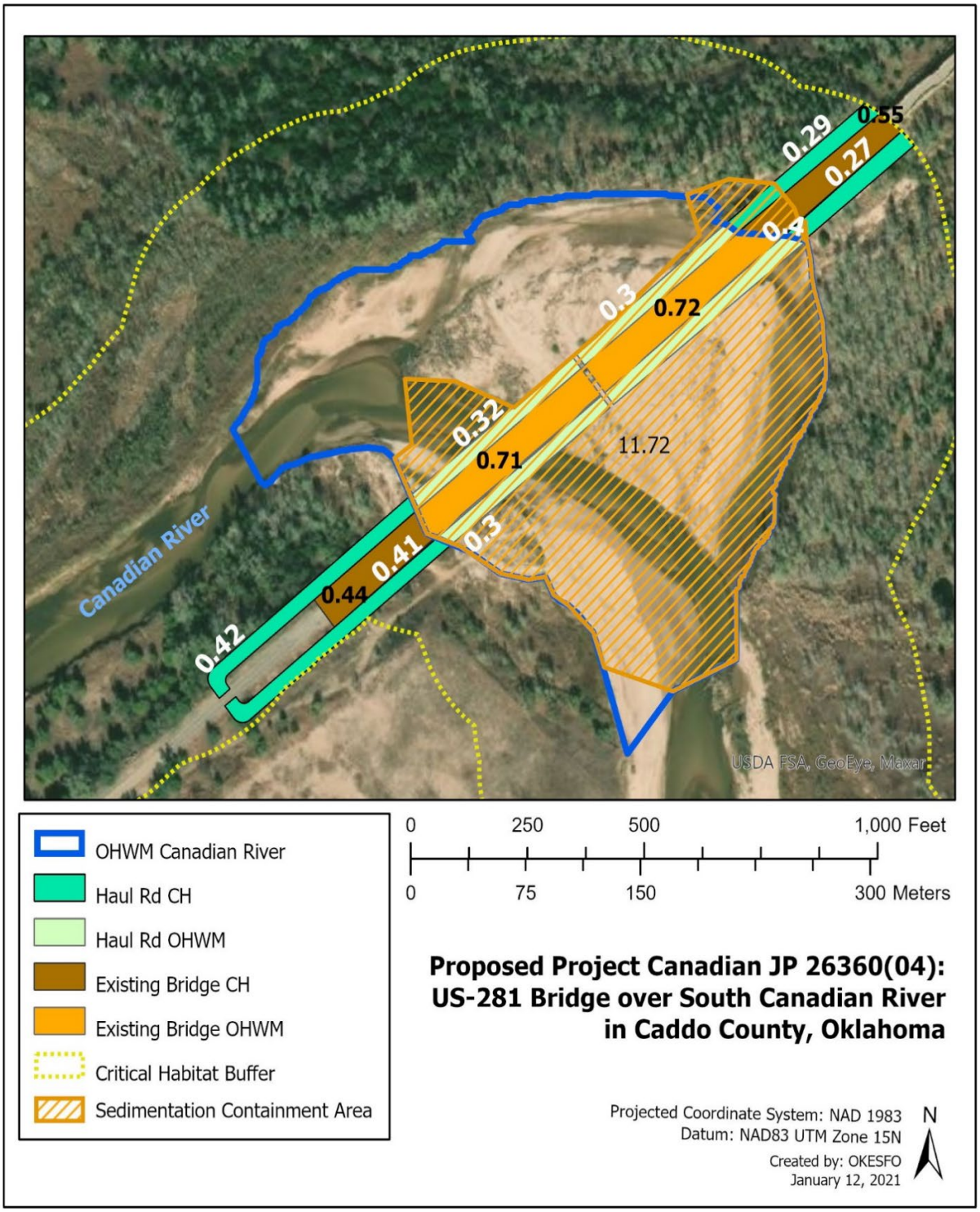

Figure 3. Map depicting proposed temporary work roads for proposed project JP 26360(04) on US-281 bridge over South Canadian River in Caddo County, Oklahoma (Sec. 2, T. 12 N., R. 10 W.).

particularly where it may be impracticable to detect or monitor take of individuals. In these situations, evaluating impacts to a surrogate, such as habitat, ecological conditions or similarly affected species may be the most meaningful measure of assessing take and is consistent with the

language and purposes of the Act and with relevant case law. As stated in the Service's May 2018 final rule, the use of surrogates in expressing take must describe the causal link between surrogate and take to the listed species, describe why it is not practical to use individuals for the take estimate and how it would be monitored, and set a clear standard for when the amount of take would be exceeded. For the purposes of this opinion, the Service defines incidental take in terms of the number of acres (hectares) impacted.

The causal link between using area of habitat as a surrogate (50 CFR §402.14(i)(1)(i)) for take of individual Arkansas River shiners is based on the fact that the stream channel is where this species resides, requiring continuously flowing water to complete its life cycle. When the wetted portion of the stream within the ordinary high water mark is altered, direct adverse effects to fish survival, reproduction and growth often occur. Although the Arkansas River shiner is able to tolerate elevated turbidity under natural conditions, deposition of fine sediments could alter habitat conditions. The Arkansas River shiner feeds on small aquatic organisms that occupy the stream channel and terrestrial insects produced within the riparian zone. Placement of fill material likely kills many of the small aquatic invertebrates used as forage by this species. Consequently, habitat loss impacts the ability of these fishes to secure food for growth and survival.

EFFECT OF THE TAKE

In the accompanying Opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the Arkansas River shiner nor result in destruction or adverse modification of its critical habitat, because most of the impacts associated with the action are temporary in nature and are expected to occur within a very limited extent of the overall known occupied range of the species.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

I. The Federal Highway Administration shall ensure that stream flows necessary for Arkansas River shiner movement and reproduction in the South Canadian River are maintained in the action area through the duration of the project.

II. The Federal Highway Administration shall ensure that the construction footprint will be minimized and the site restored to the greatest extent practicable.

III. The Federal Highway Administration shall ensure that all contractors and workers on the ground are informed of, and will abide by, all the terms and conditions set forth within this Opinion.

IV. The Federal Highway Administration shall monitor activities throughout the duration of the project to ensure take is not exceeded and will apply best adaptive management strategies for conservation of federally-listed species and their habitat.

V. The Federal Highway Administration shall implement sediment containment measures to avoid and minimize take of federally-listed species during the project.

Terms and Conditions for Implementation of Reasonable and Prudent Measures

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Highway Administration and/or the Oklahoma Department of Transportation must comply with the following terms and conditions, which implement the reasonable and prudent measures (RPM) described above and outline the reporting/monitoring requirements. These terms and conditions are non-discretionary.

Terms and Conditions for RPM I:

1. The midpoint (50 percent of the ordinary high water mark) shall be identified and clearly marked for ground crews to observe throughout the duration of the project, and confirmed with the Oklahoma Department of Transportation Natural Resources Program Biologist prior to the start of construction activities.

2. No work road shall extend beyond the midpoint of the bank full channel width of the South Canadian River during any phase of construction; this will ensure that, at any point in time, at least 50 percent of the bank full channel width is maintained and remains unobstructed by work roads. Federal Highway Administration and/or Oklahoma Department of Transportation biologists shall monitor for meeting this requirement.

3. Work roads within the ordinary high water mark of the South Canadian River will not occur during the peak spawning and larval/fry development season (May 1 to August 31) of the Arkansas River shiner.

4. During low flow conditions and while work roads are in place, best management practices to maintain adequate streamflow to facilitate fish movement will be identified by an appropriate Oklahoma Department of Transportation representative (*i.e.*, biologist), communicated to the Resident Engineer and Oklahoma Field Office, and shall be implemented accordingly.

Terms and Conditions for RPM II:

1. The area of disturbance within the stream channel, due to the construction of work roads, pads, or platforms, will be minimized to the greatest extent practicable as determined by the appropriate Resident Engineer. Additionally, the amount of riparian vegetation cleared shall only include the minimum amount necessary to complete the proposed action.

2. Work roads and pads for this project within the ordinary high water mark will be up to 30 ft (9.1 m) in width to allow for the operation and maneuvering of large equipment.

3. Vehicles or other motorized equipment shall be confined to areas outside of all wetted channels of South Canadian River, with the exception of activities related to work road/pad/platform construction, use, and road removal.

a. Once a work road/pad/platform is completed, motorized equipment use within the stream channel shall be confined to the tops of work roads/pads/platforms and not driven through the wetted channel at any other point.

b. Vehicles and other motorized equipment may not utilize the work space areas between concurrent roads as word roads. However, this space between concurrent work roads may be utilized for certain manual activities, including repair work on the substructure of the bridge.
c. Construction equipment must cross the 50 percent mark of South Canadian River over an existing bridge.

4. After each work road/pad/platform is no longer needed, fill material shall be removed and the natural contours of the river channel and bank restored to mimic the natural and pre-work road/pad/platform conditions to the maximum extent practicable.

5. Construction activities will be conducted in a manner so that no debris generated from the project activities shall be allowed to fall into the water.

6. Hazardous materials, chemicals, fuels, lubricating oils, and other such substances shall be stored at least 300 ft (91.4 m) outside of the ordinary high water mark for South Canadian River. Refueling of construction equipment also shall be conducted at least 300 ft (91.4 m) outside of the ordinary high water mark for the South Canadian River. These boundaries will be clearly marked for ground crews to observe throughout the duration of the project, and confirmed with the Oklahoma Department of Transportation Natural Resources Program Biologist prior to the start of construction activities.

7. Water shall be obtained for this project (if required for construction purposes or to water seeded/sodded areas) from a source other than the South Canadian River, its contributing tributaries (as identified by the Oklahoma Department of Natural Resources Program Biologist prior to the start of construction activities), or any other stream known to be occupied by federally-listed aquatic species, so that hydrology of the South Canadian River will not be affected by water withdrawals.

8. Asphaltic mulch will not be used. This will prevent the possible seepage of potentially toxic petroleum compounds into the adjacent stream.

9. Water repellant chemicals will not be sprayed on new bridge structure unless spray is confined solely to structure and does not contaminate surrounding surface water.

10. Vegetation shall be established in areas disturbed during project construction as soon as possible following construction, including but not limited to, reestablishment of vegetation removed from within the riparian zone as a result of this project. Revegetation shall use an appropriate mix of plant species native to the project site (including sodded areas), as per the conservation measures articulated within the Assessment and described in the **DESCRIPTION OF THE PROPOSED ACTION** section above. In areas where native vegetation could not be protected, exposed soil will be reseeded or planted with

mixtures of species native to the ecoregion. A variety of streambank stabilization techniques may be considered for use along the bridge abutments, as approved by the Resident Engineer, including live stakes, live fascines (wattles), branch packing, vegetated geo-grids, live crib-walls, joint planting, and brush mattresses. The Resident Engineer shall communicate these techniques to the Oklahoma Department of Transportation Natural Resources Program, in coordination with the Service's Oklahoma Field Office, for review and comment prior to implementation. The vegetation species utilized will be monitored after planting/seeding for successful establishment conducive to accomplishing streambank stabilization and restoration of pre-project, naturalistic conditions.

Terms and Conditions for RPM III:

1. The contractor(s) employed for the proposed work will attend a pre-construction meeting that will include specific instruction on the implementation of reasonable and prudent measures with their terms and conditions as included in this incidental take statement.

2. Specific instructions to the contractor(s) with respect to implementation of reasonable and prudent measures will be incorporated through written documentation and conspicuously included in the project plans. A figure showing the project boundary of the allowed disturbance under the incidental take statement will be included in project plans. This figure and the reasonable and prudent measures with their terms and conditions will be posted and available on site at all times during construction.

3. The contractor shall submit a detailed and explicit description of all proposed work activities (including proposed placement for temporary work roads and pads based on actual river conditions at the time of construction) and timeframes to the Oklahoma Department of Transportation biologist, through the Resident Engineer, for review and approval by the Oklahoma Field Office before construction activities begin.

Terms and Conditions for RPM IV:

1. The Federal Highway Administration and/or the Oklahoma Department of Transportation will monitor the extent of take, throughout the duration of the action, through sufficient on-site inspections scheduled to coincide with those activities anticipated to result in take.

   Monitoring will include the following:

   a. Estimating the actual area of disturbance caused by construction, use and removal of work roads, pads, and platforms, following completion of each road and/or pad/platform. If areas within the ordinary high water mark of the South Canadian River are disturbed more than once, that area of disturbance should be determined appropriately.

   b. Monitoring of stream flows visually, both upstream and downstream of the action area to ensure that stream connectivity is maintained throughout the duration of

the project. If it is anticipated that stream connectivity may be lost, the Oklahoma Field Office shall be contacted immediately. Field biologist(s) from the Oklahoma Field Office will consult with the Oklahoma Department of Transportation's biologist(s) to determine what measures, if any, may be implemented to restore connectivity. In some cases, natural conditions, not related to project activities, could lead to a loss in stream connectivity, in which case no further action would be necessary. If biologists determine that connectivity may need to be restored, numerous options may be explored, including sandbag placement or movement of channel substrate by hand. Heavy equipment shall not be used to restore stream connectivity without first contacting the Service for approval and completing consultation, as needed.

c. Monitoring length, location, area, and duration of work roads within the ordinary high water mark.

2. Reports of on-site monitoring mentioned above shall be submitted to the Service's Oklahoma Field Office every two weeks. Reports should include Geographic Positioning System (GPS) locations of work roads, photographs documenting extent of staining/discoloration caused by any sediment flowing downstream during drilling, and photographs showing work road proximity to bridge as a visual reference for length of work road in relation to ordinary high water mark. If any individual monitoring activities reveal that take may be exceeded, the Oklahoma Field Office should be immediately contacted prior to continuing any construction activities.

3. The Service's Oklahoma Field Office should be contacted at least one week prior to start of construction to alert staff of commencement of monitoring activities.

4. The Oklahoma Department of Transportation Natural Resources Program biologist will monitor re-established vegetation to assess whether restoration efforts were successful, in fulfillment of RPM II(10), and report the assessment to the Oklahoma Field Office. Monitoring assessments will be conducted during the growing season one year following completion of planting/seeding activities.

Terms and Conditions for RPM V:

1. Appropriate erosion control best management practices, as established by the Oklahoma Department of Environmental Quality to minimize impacts from storm water discharges, shall be conscientiously incorporated into the project specifications and included conspicuously as part of the project plans. The ordinary high water mark, upstream, and downstream project boundaries, and areas of sediment containment priority, shall be clearly marked for ground crews to observe throughout the duration of the project, and confirmed with the Oklahoma Department of Transportation Natural Resources Program Biologist prior to the start of construction activities.

2. Sedimentation containment and erosion controls shall be conscientiously maintained throughout the duration of project activities occurring within the 300 ft (91.4 m) riparian

buffer, the ordinary high water mark of South Canadian River, or any area identified as sediment containment priority by the Resident Engineer and/or the Oklahoma Department of Transportation Natural Resources Program Biologist, and communicated to the Field Office.

3. Temporary work roads and drill pads/platforms will be implemented in a manner that minimizes erosion, sedimentation, or permanent alteration of the stream bed or bank substrates. Work roads shall be made of crushed non-erosive rock material of sufficient size to minimize downstream movement. As described by the Oklahoma Department of Transportation Natural Resources Program in the Assessment, rocks with 12 to 24-inch (30.5 to 61 cm) nominal size with smaller rocks not less than 1.5-inch (3.8 cm) nominal size for the top surface are typically sufficient. Native rock material removed from the stream channel at the project site shall not be used during construction of the work roads, pads, or platforms.

4. Sedimentation and/or erosion control materials in a state of disrepair shall be replaced or restored promptly.

5. Construction waste materials and debris shall be stockpiled at least 25 ft (7.6 m) from the streambank, and these materials shall be removed and disposed of properly and expediently, during (as practicable) and following completion of the project. Sediment and erosion controls shall be installed and maintained around these staging areas to prohibit discharge of materials from these sites.

Reporting Requirements

The Federal Highway Administration and the Oklahoma Department of Transportation will be responsible for providing to the Service reports of project initiation, monitoring, and potential modifications as identified in the above terms and conditions.

Disposition of Injured Listed Species

Upon locating a dead, injured, or sick listed species, initial notification must be made to the Service's Law Enforcement Office, P.O. Box 610069, DFW Airport, Texas 75261 at Tel. (972) 574-3254 / Fax: (972) 574-4669 / fwsole_dfw@fws.gov and the Oklahoma Ecological Services Field Office at (918) 581-7458 within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office identified above with a copy to Oklahoma Field Office at 9014 E. 21st Street, Tulsa, Oklahoma 74129. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(l) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or develop information. Implementation of these measures would further help to minimize effects to the federally-listed species.

The Service recommends that the Federal Highway Administration and Oklahoma Department of Transportation assist in the conservation, recovery and restoration of federally-listed fish and their habitats such as the Arkansas River shiner. Status information from ongoing survey efforts are used on a regular basis by the Federal Highway Administration and Oklahoma Department of Transportation for section 7 consultations on a wide variety of construction projects across the state of Oklahoma. Contributions also could be made in the form of funding, staff, or supplies for volunteer events participating in habitat restoration for imperiled species. Additionally, biological staff from both the Federal Highway Administration and Oklahoma Department of Transportation are encouraged to provide field support during survey efforts.

While the Project will use well-established transportation and storm water best management practices, the Federal Highway Administration and Oklahoma Department of Transportation may find certain best management practices potentially applicable to many proposed projects, and it is encouraged to discuss such potential application with the Service.

When the banks around bridges are armored with rocks or concrete (rip rap) to protect roads from washout, these armored banks degrade streams by disrupting the surface-subsurface exchange from the riparian zone (Forman *et al*. 2003). Larger bridge and other projects utilizing features such as work roads and removal of riparian vegetation likewise may alter channel geomorphology, flow patterns, water quality, water temperature, and stream bed composition, as well as have direct effects on fish. As the Federal Highway Administration and Oklahoma Department of Transportation consider potential long-term solutions to these concerns, we encourage the agencies to view each project not simply as a transportation project, but as a concurrent opportunity to conserve listed species. We continue to support early consultation among the Oklahoma Department of Transportation, the Federal Highway Administration, and the Service, and encourage early coordination with interested state agencies as a favorable way to explore conservation opportunities.

The Service requests notification of the implementation of any conservation recommendations as a means of keeping the Service informed of actions undertaken to minimize or avoid adverse effects or provide conservation benefit to listed species or their habitats.

REINITIATION NOTICE

This concludes formal consultation and conference regarding Federal Highway Administration funding of the proposed construction of the Oklahoma Department of Transportation JP 26360(04) Bridge Rehabilitation on U.S. Highway 281 (US-281) over South Canadian River in

Caddo County, Oklahoma at the Canadian County line. As provided in 50 CFR §402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion or written concurrence; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the proposed species is listed or critical habitat is designated. The request must be in writing. If the Service determines there have been no significant changes in the action, as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion for the project and no further section 7 consultation will be necessary.

After listing as threatened or endangered and any subsequent adoption of this conference opinion, the Federal Highway Administration shall re-initiate consultation if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect the species in a manner or to an extent nor considered in the conference o pinion; 3) the agency action is subsequently modified in a manner that causes an effect to the species that was not considered in this opinion or written concurrences; or 4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the proposed species has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the proposed species may occur between the listing of the species and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation. Should you have any questions, or require additional assistance regarding this consultation, please contact the Oklahoma Ecological Services Field Office at (918) 581-7458.

Sincerely,

KENNETH COLLINS Digitally signed by KENNETH COLLINS Date: 2021.05.20 17:07:49 -05'00'

Kenneth Collins
Acting Field Supervisor

cc: Karen Orton, Environmental Projects Manager, FHWA - Oklahoma City, Oklahoma
Amber McIntyre, Natural Resources Program Manager, and Elizabeth Nichols, Natural Resources Program Assistant Manager, ODOT - Norman, Oklahoma

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